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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,805	06/14/2001	Peter R. C. Gascoyne	UTXC:625US/MCB	7954

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FULBRIGHT & JAWORSKI L.L.P
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EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,805

Applicant(s)

GASCOYNE ET AL.

Examiner

Jeffrey T. Barton

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1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 13 is/are allowed.
6) ☒ Claim(s) 1-12 and 14-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment filed on 31 March 2005 does not place the application in condition for allowance.

Status of Rejections Pending Since the Office Action of 27 October 2004

2. The rejection of claim 13 under 35 U.S.C. §102(b) as anticipated by Blankenstein is withdrawn.
3. The rejection of claims 1-4, 6, 10-12, and 15-18 as anticipated by Blankenstein is maintained.
4. The rejection of claims 5, 7-9, and 14 under 35 U.S.C. §103(a) as unpatentable over Blankenstein in view of Jiang et al is maintained.
5. The rejections of claims 1-18 under the judicially created doctrine of obviousness-type double patenting over Claim 17 of U.S. Patent No. 6,790,330 in view of Blankenstein or Blankenstein and Jiang et al are withdrawn due to the acceptance of the terminal disclaimer filed on 31 March 2005.

Terminal Disclaimer

6. The terminal disclaimer filed on 31 March 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,790,330 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-4, 6, 10-12, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Blankenstein.

Addressing the independent claims:

Regarding claim 1, Blankenstein discloses a method of separating matter using dielectrophoresis combined with magnetophoresis, comprising: injecting a sample into a chamber and initiating carrier medium flow at the inlet port (Page 18, lines 30-33), generating dielectrophoretic and magnetophoretic forces on the constituents (Page 8, lines 4-5; Page 9, lines 15-25; and Page 16, lines 1-15), balancing the dielectrophoretic and magnetic forces to position the constituents within the chamber (Page 3, line 18 - Page 4, line 8; Page 10, lines 31-38; Page 8, lines 4-25; Page 9, lines 15-25), and collecting the constituents at outlet ports according to their dielectric and magnetic characteristics. (Page 18, line 35 - Page 19, line 2)

Regarding claim 10, in addition to the disclosure cited above, Blankenstein discloses continuous-mode separation by a method comprising continuous injection of the sample (Page 11, lines 13-21) and collection of the constituents according to their position. (Figure 1)

Regarding claim 15, in addition to the disclosure cited above, Blankenstein discloses a method comprising labeling a sample with labels having dielectric and magnetic properties, the labels combining with sample components (Page 18, lines 22-25; Page 9, lines 15-25); providing signals to the electrodes and magnetic elements to generate fields in the chamber (Page 9, lines 15-25; Page 10, lines 31-33); continually injecting the sample into an inlet port (Page 11, lines 13-21) and collecting the constituents with similar properties at the same outlet port according to their position. (Figure 1)

Regarding claim 16, Blankenstein discloses an apparatus comprising a chamber having inlets and outlets (Figure 1); an array of electrodes for generating a dielectrophoretic force on samples in the chamber (Figure 3; Page 10, lines 31-33); an array of magnetrodes configured to generate a magnetic force on samples in the chamber (Page 8, lines 7-25); with the electrodes and magnetrodes configured to generate forces that balance each other and displace constituents within the sample according to dielectric and magnetic properties. (Page 8, line 4 - Page 9, line 25; Page 16, lines 1-16; Page 10, lines 31-33)

Regarding the limitation to "balancing the dielectrophoretic force and magnetic force to position the (sample/constituents) within the chamber" present in all method claims addressed here, the Examiner considers this to be inherent in the disclosure of Blankenstein. Blankenstein discloses the successful positioning of the materials within the chamber using the applied force (e.g. Page 3, line 18 - Page 4, line 8), the use of a combination of magnetic and dielectrophoretic forces in positioning the materials (Page

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8, lines 4-25 and Page 9, lines 15-25), and the ability to adjust the magnetic and electric fields. (Page 8, lines 21-25 and Page 10, lines 31-33) Since Blankenstein discloses the application of a combination of these fields in positioning the particles and sorting them based on differences in positioning within the chamber, it must follow that a balance of the forces is present.

Addressing the dependent claims:

Regarding claims 2 and 11, Blankenstein discloses the sample comprising analytes mixed with labels having magnetic and dielectric properties. (Page 18, lines 22-25; Page 10, lines 15-25)

Regarding claims 3 and 12, Blankenstein discloses the sample comprising plural labels (Page 18, lines 22-25; Page 10, lines 15-25; more than one bead will be present - claim does not limit to *different* first and second properties)

Regarding claim 4, Blankenstein discloses constituents traveling at velocities dependent on their positions in the chamber. (Page 5, line 29 - Page 6, line 3; Page 22, lines 2-4; Page 6, line 33 - Page 7, line 5; varying position in laminar flow system will lead to varying velocities)

Regarding claim 6, Blankenstein discloses collecting constituents with different properties emerging at different positions from plural outlet ports. (Page 8, lines 27-36)

Regarding claim 17, Blankenstein discloses the magnetodes comprising permanent magnets. (Page 8, line 7)

Regarding claim 18, Blankenstein discloses the outlet port comprising multiple ports for collecting bands of fluid that travel through the chamber at defined positions.
(Page 8, lines 27-36)

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 5, 7-9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blankenstein in view of Jiang et al.

Addressing claim 5:

Blankenstein discloses a method as disclosed above in addressing claim 1.

Blankenstein does not explicitly disclose a method comprising collecting different constituents emerging at different times from the outlet ports.

Jiang et al disclose a field flow fractionation device of similar design (i.e. inlets, outlets, chamber with field-application means for causing separation; Figures 1a and 1b) which uses magnetophoresis and/or dielectrophoresis to cause separation of components (Columns 1 and 2) that are collected as they emerge at different times from the outlet port, based on magnetic and/or dielectric properties. (Figures 6-9)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Blankenstein by performing an analysis in

batch mode to utilize differential velocities in the separation, as taught by Jiang et al, because it would provide additional analytical data based on elution time. (e.g. mass, polarizability, magnetic susceptibility)

Addressing claims 7-9:

In addition to the disclosure cited above for claim 1, Blankenstein discloses flow that causes the constituents to travel at velocities dependent upon their positions in the chamber (Page 5, line 29 - Page 6, line 3; Page 22, lines 2-4; Page 6, line 33 - Page 7, line 5; varying position in laminar flow system will lead to varying velocities)

Regarding claim 8, Blankenstein discloses the sample comprising analytes mixed with labels having magnetic and dielectric properties. (Page 18, lines 22-25; Page 10, lines 15-25)

Regarding claim 9, Blankenstein discloses the sample comprising plural labels (Page 18, lines 22-25; Page 10, lines 15-25; more than one bead will be present - claim does not limit to *different* first and second properties)

Blankenstein does not explicitly disclose injection of a sample aliquot, or collecting constituents according to time-of-exit from an outlet port in a batch-mode run.

Jiang et al disclose a field flow fractionation device of similar design (i.e. inlets, outlets, chamber with field-application means for causing separation; Figures 1a and 1b) which uses magnetophoresis and/or dielectrophoresis to cause separation (Columns 1 and 2) of components of a sample aliquot (Column 19, lines 20-24) that are

collected as they emerge at different times from the outlet port, based on magnetic and/or dielectric properties. (Figures 6-9)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Blankenstein by performing an analysis in batch mode to utilize differential velocities in the separation, as taught by Jiang et al, because it would provide additional analytical data based on elution time. (e.g. mass, polarizability, magnetic susceptibility)

Addressing claim 14:

In addition to the disclosure cited above for claim 1, Blankenstein discloses a method comprising labeling a sample with labels having dielectric and magnetic properties, the labels combining with sample components (Page 18, lines 22-25; Page 9, lines 15-25); providing signals to the electrodes and magnetic elements to generate fields in the chamber (Page 9, lines 15-25; Page 10, lines 31-33); and using the flow to cause the analytes and complexes to travel at velocities dependent upon their positions within the channel (Page 5, line 29 - Page 6, line 3; Page 22, lines 2-4; Page 6, line 33 - Page 7, line 5; varying position in laminar flow system will lead to varying velocities)

Blankenstein does not explicitly disclose a method comprising collecting the analyte-label complexes having similar properties in a single elution peak.

Jiang et al disclose a field flow fractionation device of similar design (i.e. inlets, outlets, chamber with field-application means for causing separation; Figures 1a and 1b) which uses magnetophoresis and/or dielectrophoresis to cause separation

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(Columns 1 and 2) of components of a sample aliquot that are collected as they emerge from the outlet port, based on their magnetic and/or dielectric properties, with similar components detected as single peaks. (Figures 6-9)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Blankenstein by performing an analysis in batch mode to utilize differential velocities in the separation and collect separated components as peaks of similar substances, as taught by Jiang et al, because it would provide additional analytical data based on elution time. (e.g. mass, polarizability, magnetic susceptibility)

Allowable Subject Matter

11. Claim 13 is allowed.

Response to Arguments

12. Applicant's arguments, see Section C2, pages 8-9 of the Amendment filed 31 March 2005, with respect to the rejection of claim 13 have been fully considered and are persuasive. The rejection of claim 13 has been withdrawn.

13. Applicant's other arguments filed 31 March 2005 have been fully considered but they are not persuasive.

Applicant argues that "nowhere in the cited anticipation reference . . . does Blankenstein disclose or suggest balancing the dielectrophoretic force and magnetic

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force to position the constituents within the chamber.” (Amendment Page 8, lines 3-5)

This limitation and a related limitation in apparatus claim 16, “wherein the electrodes and magnetrodes are configured to generate forces that balance one another . . .” are the basis of the arguments presented against the rejections that have been maintained.

Regarding these limitations to “balancing the dielectrophoretic force and magnetic force to position the (sample/constituents) within the chamber” present in all method claims, the Examiner considers this to be inherent in the disclosure of Blankenstein. As described above, Blankenstein discloses the successful positioning of the materials within the chamber using the applied force (e.g. Page 3, line 18 - Page 4, line 8), the use of a combination of magnetic and dielectrophoretic forces in positioning the materials (Page 8, lines 4-25 and Page 9, lines 15-25), and the ability to adjust the magnetic and electric fields. (Page 8, lines 21-25 and Page 10, lines 31-33) Since Blankenstein discloses the application of a combination of these fields in positioning the particles and sorting them based on differences in positioning within the chamber, it must follow that a balance of the forces is present in order for the device to function. Regarding apparatus claim 16 and its dependent claims, the electrodes and magnetrodes would likewise inherently have to be configured to allow the balance necessary for the operation of the device of Blankenstein with combined magnetic and dielectrophoretic forces. Therefore, the rejections of claims 1-12 and 14-18 are considered valid, and are maintained.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

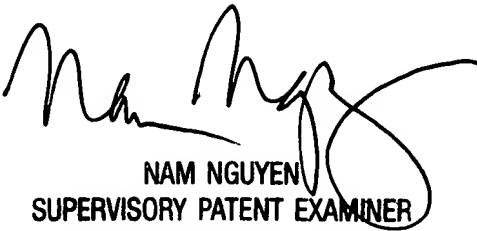
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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JTB
May 11, 2005



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